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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

R. Bharat Rao et al.

Serial No. 10/727,197

Filing Date: December 3, 2003

For: Systems and Methods for  
 Automated Extraction And  
 Processing of Billing Information in  
 Patient Records

Examiner Vanel Frenel

Group Art Unit No. 3626

Docket No.: 2002P19745US02

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**APPEAL BRIEF (SUPPLEMENTAL) FOR NEW APPEAL/REINSTATEMENT  
 AFTER PROSECUTION WAS REOPENED**

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Dear Sir:

By the filing of this Appeal Brief in accordance with 37 CFR § 41.37, Appellants respectfully request reconsideration of the above-identified patent application by the Board of Patent Appeals and Interferences.

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**Real Party in Interest**

The real party in interest is Siemens Medical Solutions USA, Inc., an organization having a place of business in Malvern, Pennsylvania.

**Related Appeals and Interferences**

There have not been (except for an Appeal Brief filed on August 10, 2006) and are no pending appeals, interferences or judicial proceedings which may be related to, directly effect or be directly affected by or have bearing on the Board's decision in this appeal.

**Status of Claims**

1. Claims 1-51 are present and pending in the application.
2. Claims 1-51 have been finally rejected.
3. The rejections of claims 1-51 are being appealed. Arguments are submitted below for claims 1, 5-14, 18-25, 28-31, 35-37, 39 and 42-51.

**Status of Amendments**

No amendment has been filed subsequent to the Final Office Action dated March 13, 2006.

**Summary of Claimed Subject Matter**

There are three (3) independent claims involved in this appeal: claims 1, 25 and 39. In addition, there are thirty-four (34) dependent claims involved in this appeal: claims 5-14, 18-24, 28-31, 35-37 and 42-51.

**A. Independent Claims:**

1. Independent claim 1 recites a method for processing medical information (e.g., Figs. 5-8; page 7, lines 14-19; page 19, lines 6-9; page 24, lines 11-14; page 26, lines 4-9; and page 28, lines 17-22), comprising the steps of: obtaining a medical record of a patient (e.g., page 20, lines 1-10; page 24, lines 14-19; page 26, lines 10-15;

and page 28, line 22–page 29, line 5), wherein the medical record comprises patient information from structured and unstructured data sources (e.g., page 2, lines 1-3; page 4, lines 7-14; Fig. 2; page 9, lines 11-23; and page 10, lines 1-7); analyzing with a computer the patient information from at least the unstructured data source in the medical record using domain-specific criteria (e.g., page 4, lines 8-13; page 12, lines 7-21; page 14, lines 6-18; and page 17, line 3–page 18, line 7); and automatically extracting billing information from the medical record as part of the analysis (e.g., page 7, lines 16-19; page 14, line 11- page 15, line 6; page 19, lines 6-7; page 20, line 11- page 21, line 3; page 24, lines 11-14; page 24, line 19-page 25, line 12; page 26, lines 4-23; and page 28, line 17- page 29, line 15).

2. Independent claim 25 recites a system for processing medical information (e.g., Fig. 1; and page 8, lines 9-14), comprising: an electronic database (e.g., page 12, lines 1-8) comprising a knowledge base of domain-specific criteria (e.g., Fig. 1; page 12, line 7-page 13, line 14; page 14, lines 4-10; and page 18, lines 10-21); and an engine of a device that automatically extracts billing information from a medical record the medical record comprising patient information from structured and unstructured data sources (e.g., Fig. 1; page 2, lines 1-3; page 4, lines 7-14; page 9, lines 11-23; page 10, lines 1-7; page 11, line 22–page 12, line 18; page 17, lines 13-17; and page 20, lines 11-13), by analyzing the patient information from at least the unstructured data source using the domain-specific criteria (e.g., page 4, lines 8-13; page 9, lines 21-23; page 10, lines 4-7; page 14, lines 6-18; and page 17, line 3–page 18, line 7).

3. Independent claim 39 recites in a program storage device readable by a machine, tangibly embodying a program of instructions executable on the machine to perform steps for processing medical information, the program storage device comprising instructions for (e.g., page 8, lines 1-8): obtaining a medical record of a patient, wherein the medical record comprises patient information from structured and unstructured data sources (e.g., page 2, lines 1-3; page 4, lines 7-14; Fig. 2; page 9, lines 11-23; and page 10, lines 1-7); analyzing the patient information from at least the unstructured data source in the medical record using domain-specific criteria (e.g., page 4, lines 8-13; page 12, lines 7-21; page 14, lines 6-18; and page 17, line 3–page 18, line 7); and automatically extracting billing information from the medical record as part of the

analysis (e.g., page 7, lines 16-19; page 14, line 11- page 15, line 6; page 19, lines 6-7; page 20, line 11- page 21, line 3; page 24, lines 11-14; page 24, line 19-page 25, line 12; page 26, lines 4-23; and page 28, line 17- page 29, line 15).

**Dependent Claims:**

4. Dependent claim 5 recites the method of claim 1, wherein extracting billing information comprises extracting all billing codes that are supported by the patient information based on all domain-specific criteria in a domain knowledge base (e.g., page 4, lines 15-19; page 15, lines 7-20; page 20, lines 13-17; page 24, line 22–page 25, line 3; and page 26, lines 15-19).

5. Dependent claim 6 recites the method of claim 1, wherein the domain-specific criteria comprises institution-specific domain knowledge (e.g., page 4, lines 18-19; and page 18, lines 17-21).

6. Dependent claim 7 recites the method of claim 6, wherein the Institution-specific domain knowledge relates to one or more of data at a hospital, document structures at a hospital, policies of a hospital, guidelines of a hospital, and variations at a hospital (e.g., page 18, lines 18-21).

7. Dependent claim 8 recites the method of claim 1, wherein the domain-specific criteria includes condition-specific or disease-specific domain knowledge (e.g., page 4, lines 18-19; page 12, lines 8-18; and page 18, lines 12-17).

8. Dependent claim 9 recites the method of claim 8, wherein the condition-specific or disease-specific domain knowledge includes one or more of factors that influence risk of a condition or disease, disease progression information, complications information, outcomes and variables related to a condition or disease, measurements related to a condition or disease, and policies and guidelines established by medical bodies (e.g., page 18, lines 14-17).

9. Dependent claim 10 recites the method of claim 1, further comprising generating an explanation that includes one or more pointers to relevant patient information, relevant domain-specific criteria, or relevant patient information and domain-specific criteria, which supports the extracted billing information (e.g., page 22, line 1–page 23, line 6; page 25, lines 9-11; and page 28, lines 2-5).

10. Dependent claim 11 recites the method of claim 10, further comprising presenting the explanation to a user for verifying the billing information (e.g., page 22, lines 8-16; page 23, lines 9-12; and page 24, lines 1-10).

11. Dependent claim 12 recites the method of claim 1, further comprising automatically generating a medical claim for the patient using the extracted billing information (e.g., page 5, lines 8-11; page 15, line 21-page 16, line 2; and page 25, lines 13-16).

12. Dependent claim 13 recites the method of claim 1, further comprising: presenting the extracted billing information to the user for verification (e.g., page 22, lines 8-16; page 23, lines 9-12; and page 24, lines 1-10); and automatically generating a medical claim for the patient using the extracted billing information, if the extracted billing information is verified by the user (e.g., page 5, lines 8-11; page 15, line 21-page 16, line 2; and page 25, line 13-page 26, line 3).

13. Dependent claim 14 recites the method of claim 13, further comprising: modifying the extracted billing information in response to user input, if the billing information is not verified by the user (e.g., page 15, lines 9-18; and page 23, line 20-page 24, line 10); and automatically generating a medical claim for the patient using the modified extracted billing information (e.g., page 5, lines 8-11; page 15 line 21-page 16, line 2; and Fig. 6).

14. Dependent claim 18 recites the method of claim 1, further comprising: (a) automatically assessing the quality of the patient information of the medical record using the extracted billing information to obtain quality assessment results (e.g., page 5, lines 12-21; page 16, lines 5-15; and page 27, line 3-page 28, line 4); and (b) storing the quality assessment results for the medical record (e.g., page 16, lines 15-16; page 28, lines 4-5; and Fig. 7).

15. Dependent claim 19 recites the method of claim 18, further comprising performing steps (a) and (b) for a plurality of medical records in an electronic database (e.g., page 28, lines 5-7); and automatically generating quality assurance statistics based on the quality assessment results obtained for the plurality of medical records (e.g., page 28, lines 8-16; and Fig. 7).

16. Dependent claim 20 recites the method of claim 18, wherein the quality assessment results comprise information regarding occurrences of correct, incorrect and/or missing billing codes in the medical record (e.g., page 28, lines 12-16).

17. Dependent claim 21 recites the method of claim 1, further comprising automatically determining an expected amount of medical billing reimbursement based on the extracted billing information (e.g., page 5 line 22–page 6, line 4; page 16, line 16–page 17, line 2; page 29, line 16–page 30, line 2; and Figure 8).

18. Dependent claim 22 recites the method of claim 21, further comprising: maintaining the expected amount in the medical record (e.g., page 29, lines 20-23); and reconciling the expected amount with an actual reimbursement received (e.g., page 17, lines 1-2).

19. Dependent claim 23 recites the method of claim 21, wherein determining an expected amount of medical billing reimbursement further depends on whether or not clinical guidelines have been followed as specified by domain-specific criteria (e.g., page 29, line 23–page 30, line 2).

20. Dependent claim 24 recites the method of claim 10, wherein the explanation further comprises information as to whether or not clinical guidelines have been followed as specified by domain-specific criteria (e.g., page 22, lines 7-10).

21. Dependent claim 28 recites the system of claim 25, wherein the engine generates an explanation that includes one or more pointers to relevant patient information, relevant domain-specific criteria, or relevant patient information and domain-specific criteria, which supports the extracted billing information (e.g., page 22, line 1–page 23, line 6; page 25, lines 9-11; and page 28, lines 2-5).

22. Dependent claim 29 recites the system of claim 28, further comprising a user interface for presenting the explanation to a user to enable the user to verify the extracted billing information (e.g., page 22, lines 8-16; page 23, lines 9-12; and page 24, lines 1-10).

23. Dependent claim 30 recites the system of claim 26, further comprising an automated billing system that automatically generates a medical claim for the patient using the extracted billing information output from the engine (e.g., page 5, lines 8-11; page 15, line 21–page 16, line 2; and page 25, line 13–page 26, line 3).

24. Dependent claim 31 recites the system of claim 30, further comprising a user interface that presents the extracted billing information to a user and enables a user to verify the extracted billing information and modify the extracted billing information before automatically generating a medical claim based on the verified or modified billing information (e.g., page 23, lines 9-19; page 24, lines 1-4; and page 25, line 13–page 26, line 3.).

25. Dependent claim 35 recites the system of claim 25, wherein the engine can automatically assess the quality of patient information for each of a plurality of medical records using extracted billing information from each of the medical records and automatically generate quality assurance statistics based on the quality assessment results obtained for the plurality of medical records (e.g., page 5, lines 12-21; page 16, lines 5-15; page 27, line 3–page 28, line 5; and Fig. 7).

26. Dependent claim 36 recites the system of claim 35, wherein the quality assessment results comprise information regarding occurrences of correct, incorrect and/or missing billing codes in the medical record (e.g., page 28, lines 12-16).

27. Dependent claim 37 recites the system of claim 25, wherein the engine can automatically determine an expected amount of medical billing reimbursement based on the extracted billing information from the medical record and reconciles the expected amount with an actual reimbursement received (e.g., page 5 line 22–page 6, line 4; page 16, line 16–page 17, line 2; page 29, line 16–page 30, line 2; and Figure 8).

28. Dependent claim 42 recites the program storage device of claim 39, wherein the instructions for extracting billing information comprise instructions for extracting all billing codes that are supported by the patient information based on all domain-specific criteria in a domain knowledge base (e.g., page 4, lines 15-19; page 15, lines 7-20; page 20, lines 13-17; page 24, line 22–page 25, line 3; and page 26, lines 15-19).

29. Dependent claim 43 recites the method of Claim 1 wherein automatically extracting comprises inferring a diagnosis and the associated billing information from the medical record (e.g., page 17, line 13–page 18, line 7; and page 20, lines 11-17).

30. Dependent claim 44 recites the method of Claim 43 wherein inferring comprises inferring the diagnosis and the associated billing information from the

medical record without reference to diagnosis codes (e.g., page 20, lines 17-21; and page 25, lines 3-7).

31. Dependent claim 45 recites the method of Claim 43 wherein inferring comprises determining a probability (e.g., page 17, line 17-page 18, line 7).

32. Dependent claim 46 recites the system of Claim 25 wherein the engine is operable to infer a diagnosis and the associated billing information from the medical record (e.g., page 17, line 13-page 18, line 7; and page 20, lines 11-17).

33. Dependent claim 47 recites the system of Claim 46 wherein the engine is operable to infer the diagnosis and the associated billing information from the medical record without reference to diagnosis codes (e.g., page 20, lines 17-21; and page 25, lines 3-7).

34. Dependent claim 48 recites the system of Claim 46 wherein the engine is operable to determine a probability associated with the Inferred diagnosis (e.g., page 17, lines 17-21; and page 18, lines 4-7).

35. Dependent claim 49 recites the program storage device of Claim 39 wherein automatically extracting comprises inferring a diagnosis and the associated billing information from the medical record (e.g., page 17, line 13-page 18, line 7; and page 20, lines 11-17).

36. Dependent claim 50 recites the program storage device of Claim 49 wherein inferring comprises inferring the diagnosis and the associated billing information from the medical record without reference to diagnosis codes (e.g., page 20, lines 17-21; and page 25, lines 3-7).

37. Dependent claim 51 recites the program storage device of Claim 49 wherein inferring comprises determining a probability (e.g., page 17, lines 17-21; and page 18, lines 4-7).

### **Grounds of Rejection to be Reviewed on Appeal**

The ground of rejection on Appeal is:

1. The rejection of claim 1-51 under 35 U.S.C. § 103(a) as being unpatentable over *Evans* (U.S. Patent No. 6,347,329) in view of *Harvin/Virginia et al.* (Managed Care: New Financial Practice/Strategies...) and further in view of *PR*



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*Newswire* (iMedica Creates the Most Comprehensive..., *PR Newswire*, N.Y. Jan. 18, 2000).

Two articles are referenced by the Examiner and herein by paragraph numbers added by the Examiner. For ease of reference, the articles *Harvin/Virginia et al.* and *PR Newswire* are attached in a "Prior Art" appendix at page 32.

### Argument

#### 1. Argument with Respect to Ground of Rejection No. 1

Reversal of the Examiner's rejection of claims 1-51 under 35 U.S.C. § 103(a) as being unpatentable over *Evans* in view of *Harvin/Virginia et al.* and further in view of *PR Newswire* is respectfully requested for the reasons set forth below.

MPEP 2142 states that "[to] establish a prima facie case of obviousness ... the prior art reference ... must teach or suggest all the claim limitations." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). However, the combination of *Evans*, *Harvin/Virginia et al.* and *PR Newswire* falls to teach, either expressly or inherently, each and every element recited in the claims discussed below. Moreover, the combined references provide no teaching or suggestion as to the desirability of modifying to include each and every element of the rejected claims.

#### *(a) Rejection of Independent Claims 1, 25 and 39*

Independent claim 1 recites obtaining a medical record comprising patent information from structured and unstructured data sources, analyzing the patient information from at least the unstructured data using domain specific criteria with a computer, and automatically extracting billing information as a function of the analysis. The combination of references and each reference fails to teach or suggest "analyzing with a computer the patient information from at least the unstructured data source in the medical record using domain-specific criteria; and automatically extracting billing information from the medical record as part of the analysis."

The file history indicates that these references fail to disclose the limitations of claim 1. In the first Office Action, dated Sept. 10, 2004, claim 1 was rejected as obvious over *Evans* in view of *Harvin/Virginia et al.* However, in the second Office Action dated

April 8, 2005, it was determined that *Evans* and *Harvin/Virginia et al.* do not disclose analyzing "with a device," "from at least the unstructured data source," and "automatically extracting billing information from the medical record as part of the analysis."

Yet, in the third Office Action dated September 21, 2005, it was asserted that, although *Evans* does not disclose "analyzing with a computer the patient information from at least the unstructured data source in the medical record using domain-specific criteria; and automatically extracting billing information from the medical record as part of the analysis," these features were known in the art as evidenced by *Harvin/Virginia et al.*

Then, in the fourth Office Action dated March 13, 2006, the Examiner again acknowledged "neither *Evans* nor *Harvin/Virginia et al.* disclose analyzing unstructured data with the aid of a device, such as a computer, to automatically extract billing information, such as codes." Instead, these features were asserted as known in the art as evidenced by *PR Newswire*.

In the Advisory Action dated May 31, 2006—responsive to Applicant's argument that *PR Newswire* fails to teach analyzing with a computer "from at least the unstructured data source" and "automatically extracting billing information from the medical record as part of the analysis"—it was again asserted that these features were known in the art as evidenced by *Harvin/Virginia et al.*

In the latest Office Action (dated January 26, 2007), reopening prosecution after the Appeal Brief, *Evans* and *Harvin/Virginia et al.* are again noted as "not explicitly" disclosing "analyzing with a computer the patient information from at least the instructed data source in the medical record using domain-specific criteria" (page 3). *PR Newswire* is alleged to suggest this limitation at page 2, paragraphs 2-5. This new ground of rejection is not new.

The vacillation in assertions is because none of the cited references (*Evans*, *Harvin/Virginia et al.* and *PR Newswire*) teach or suggest "analyzing with a computer the patient information from at least the unstructured data source in the medical record using domain-specific criteria; and automatically extracting billing information from the medical record as part of the analysis."

*Evans* discloses point-of-care gathering of the medical record of a patient in a wide variety of data formats, including legacy data (col. 2, lines 43-49), patient identifiers (col. 3, lines 9-13), x-ray images (col. 5, lines 6-8), laboratory test results (col. 5, lines 6-8), medications (col. 5, lines 6-8), and text (col. 9, lines 5-12). Pointers are used to link the various data (col. 8, lines 34-65). Some data may be converted to supported formats (col. 10, lines 28-31; and col. 12, lines 42-58) to enable the physician to enter results, evaluate medical history, annotate images and prescribe medications or treatments (col. 5, lines 15-26). Data is gathered in a known structure. Different modules communicate to assist in identifying further needs during physician review (col. 6, lines 19-41; and col. 7, lines 62-66). Practice guidelines are also included to assist the physician (col. 7, lines 62-66). Other than these data collection functions, the system can create graphs, identify medication interactions, allow user selection, allow user sorting and allow user analysis (col. 15, lines 11-18). For example, the diagnosis module communicates with a procedure module to obtain information on proper administration of procedures indicated by diagnosis (col. 11, lines 15-35). *Evans* collects data and performs simple searching for use by the physician at the point of care. Some data is converted from one structure to another, so the simple searching may be based on a known data structure. *Evans* does not disclose analyzing with a computer unstructured data in the medical record, such as free text or images. The free text and images are merely provided for physician review and annotation.

In the Advisory Action, the Examiner relied on *Evans* to show analyzing unstructured data. In particular, the Examiner quoted "the converter 372 receives information from the data source 370 and transforms the information into an electronic format compatible with the EMP system (see *Evans*, col. 12, lines 45-59)" (Advisory Action, page 2, ¶ C). The above quote deals with converting information from a legacy system to the point-of-care system (col. 12, lines 40-45). The legacy information may be paper (col. 12, lines 40-45). The conversion merely creates an electronic file in a desired format (col. 12, lines 45-55). The electronic data is then incorporated into the patient record (col. 12, lines 55-58). As discussed above, *Evans* uses pointers to different information in the patient record. There is no disclosure of analysis with a computer of the unstructured data. *Evans* gathers or collects information electronically

and provides links, but does not analyze unstructured data. *Evans* does not suggest analyzing the unstructured data with a computer.

*Harvin/Virginia et al.* disclose a computer database with billing information (page 4, paragraph 3). The medical record is used to provide customized lists of common complaints, to provide automatic alerts, to provide reminders, for checking drug interactions and to provide access to data (page 4, paragraph 3). The data is collected into a known structure at the point-of-care—"by structuring the data we capture at the point-of-care..." (page 4, paragraph 4). The patient records are part of a "structured Oracle database" (page 4, paragraph 3), and such structure allows searches (page 4, paragraph 7). *Harvin/Virginia et al.*, like *Evans*, uses a structured medical record for searching. There is no suggestion for analyzing with a computer unstructured data in the medical record.

In the Advisory Action, the Examiner relied on *Harvin/Virginia et al.* to show analyzing with a computer from at least the unstructured data source and automatically extracting billing information from the medical record as part of the analysis (Advisory Action, page 2, ¶ B). In particular, the Examiner quotes "that is why at NDHC we are proposing system changes to provide a better service to our customers. Our vision is to enhance the present practice management system to cover managed care, case management, appointment scheduling, and electronic medical records" (page 3, paragraph 11). This general quote shows scheduling and electronic files. The general quote does not suggest the claim limitation of analyzing with a computer from at least the unstructured data source and automatically extracting billing information from the medical record as part of the analysis. As discussed above, *Harvin/Virginia et al.* provide clear statements of using structured data.

Not only do *Harvin/Virginia et al.* not disclose using unstructured data, the whole point of *Harvin/Virginia et al.* is circumventing the need for analyzing unstructured data. The approach that *Harvin/Virginia et al.* provides is to enter structured data. Using unstructured data is not considered by *Harvin/Virginia et al.* and there is no suggestion of a way of analyzing unstructured data.

*PR Newswire* discloses gathering data at the point-of-care (page 2, paragraph 11). Charting on a real-time basis creates an Internet record, and allows instant access

from an Internet connected computer (page 2, paragraph 11). The physician is guided through a sequence of choices and codes with a preinstalled template for a given diagnosis (page 2, paragraph 5). Billing codes may be created based on choices made using the charting template (page 3, paragraph 13). The billing is recommended from the structured inputs to the template, not analysis of unstructured data. The program is not a diagnostic tool (page 2, paragraph 5). A billing code is based on physician selections in the chart template—not extracting billing information as a function of analysis of unstructured data.

The Examiner now alleges that *PR Newswire*, at page 2, paragraphs 2-5 and previously alleged that *PR Newswire*, at page 2, paragraphs 2-3 and 11-12 and page 3, paragraph 1, teach analysis by a device of unstructured data and extraction of billing information as a function of the analysis. Paragraph 11 (page 2) describes charting on a real-time basis to create an Internet record, and allowing instant access from an Internet connected computer. Unstructured data is not even disclosed. Paragraph 5 indicates charting in a structured format by using templates. Paragraph 11 adds Internet access, not analysis by a device of unstructured data. Internet access also does not provide for extraction of billing information as a function of the analysis. Paragraph 11 does not suggest analysis by a device of unstructured data or extracting billing information as a function of the analysis.

Paragraph 12 (page 2) discloses maintaining the electronic medical record in a secure database with encryption and redundancy. There is no suggestion to analyze unstructured data. Secure and redundant storage also does not provide for extraction of billing information as a function of the analysis of unstructured data.

Paragraph 1 (page 3) discloses recommendation of billing codes based on charting results for accurate billing. Unstructured data is not disclosed. The chart uses a template once a diagnosis is determined by the physician. The billing is recommended from the structured inputs, not unstructured data. Any analysis is to provide a billing code based on physician selections in the chart template not to extract billing information as a function of analysis of unstructured data.

Paragraphs 2-3 (page 2) discloses Internet access, a wireless computer with a knowledge base for record keeping and generating billing codes. As discussed above,

there is no disclosure of analysis of unstructured data. The billing codes are provided based on knowledgebase guided charting, so are not extracted as a function of analysis of unstructured data.

Paragraph 4 (page 2) is a heading for paragraph 5 detailed below. The heading indicates that the knowledgebase is the key to intelligent rapid charting. As discussed above, the knowledge base is the template to guide charting at the point of entry or care. This paragraph does not suggest codes extracted as a function of analysis by a computer of unstructured data.

*PR Newswire* provides a structured format by guiding the physician through a sequence of choices and codes with a preinstalled template for a given diagnosis (page 2, paragraph 5). Billing codes are based on these results. Rather than analyze unstructured data, *PR Newswire* shows creating the data in a computer guided method. There is no analysis of unstructured data.

*Evans, Harvin/Virginia et al.* and *PR Newswire* teach gathering data. Any analysis with a computer is not an analysis of unstructured data.

*Evans, Harvin/Virginia et al.* and *PR Newswire* also do not teach or suggest using domain knowledge to extract information from unstructured patient records. Both *Evans* and *Harvin/Virginia et al.* refer to the use of domain knowledge in order to improve clinical workflow prospectively, such as using knowledge about guidelines to provide alerts to care providers about what treatment to give the patient next. This domain knowledge is used to make a decision based on data (e.g., if data says X, do Y). *PR Newswire* also operates as a point-of-care system, guiding with a template during input and not with analysis of unstructured data. These references do not suggest using the domain knowledge specifically to extract information from unstructured sources in the medical record.

For either reasons above, the combination of *Evans, Harvin/Virginia et al.* and *PR Newswire* does not teach or suggest "analyzing with a computer the patient information from at least the unstructured data source in the medical record using domain-specific criteria; and automatically extracting billing information from the medical

record as part of the analysis," as required by independent claim 1. The claimed invention would not have been obvious in view of this combination of references. Accordingly, reversal of this ground of rejection is respectfully requested.

Independent claim 25 recites an engine of a device that analyzes structured and unstructured data as a function of domain specific criteria and extracts billing information as a function of the analysis. As noted above, any searching or analysis provided by the system described in *Evans* is based on analysis of structured data—not unstructured data, as required by the claimed invention. Similarly, the patient records described in *Harvin/Virginia et al.* are structured and no analysis of unstructured data is provided. Likewise, in *PR Newswire* there is no analysis of unstructured data. Rather than analyze unstructured data, *PR Newswire* shows creating the data in a computer guided method. The combination of *Evans*, *Harvin/Virginia et al.* and *PR Newswire* does not teach or suggest "an engine of a device that automatically extracts billing information from a medical record the medical record comprising patient information from structured and unstructured data sources, by analyzing the patient information from at least the unstructured data source using the domain-specific criteria," as required by independent claim 25. Accordingly, reversal of this ground of rejection is respectfully requested.

In the last Office Action (dated January 26, 2007), *Evans*, col. 8, lines 34-67 is cited as showing a system for analyzing the patient information from at least the unstructured data source using domain specific criteria (page 11) despite the claim 1 acknowledgement that *Evans* does "not explicitly disclose...analyzing with a computer the patient information from at least the unstructured data source in the medical record using domain-specific criteria" (page 3).

As discussed above for claim 1, *Evans* shows pointers to link data at col. 8, lines 34-65. Free text and images are provided for review and annotations, and new data is gathered in a structure. *Evans* does not show an engine for analyzing the patient information from at least the unstructured data source using the domain specific criteria.

Independent claim 39 recites instructions for a program implemented on a machine for analyzing unstructured data. As noted above, any searching or analysis described in *Evans* is based on analysis of structured data—not unstructured data, as required by the claimed invention. Similarly, the patient records described in *Harvin/Virginia et al.* are structured and no analysis of unstructured data is provided. Likewise, in *PR Newswire* there is no analysis of unstructured data. Rather than analyze unstructured data, *PR Newswire* shows creating the data in a computer guided method. The combination of *Evans*, *Harvin/Virginia et al.* and *PR Newswire* does not teach or suggest “analyzing the patient information from at least the unstructured data source in the medical record using domain-specific criteria; and automatically extracting billing information from the medical record as part of the analysis,” as required by independent claim 39. Accordingly, reversal of this ground of rejection is respectfully requested.

*(b) Rejection of Claims 5 and 42*

Claims 5 and 42 recite extracting all billing codes that are supported by the patient information based on all domain-specific criteria in a domain knowledge base. *Evans* discloses converting data and structured formats. *Evans* refers to the use of domain knowledge in order to improve clinical workflow prospectively, such as using knowledge about guidelines to provide alerts to care providers about what treatment to give the patient next. *Evans* does not extract all billing codes.

In the Advisory Action, the Examiner relies on *Evans* for the limitations of claims 5 and 42 (Advisory Action, page 2, ¶D). In particular, the Examiner quotes “the present invention creates and maintains all patient data electronically” of *Evans* at col. 14, lines 37-44. Maintaining all data electronically is not extracting all billing codes supported by patient information. The electronic data may support more than one billing code.

In the most recent Office Action (dated January 26, 2007), *PR Newswire* is cited to show the limitations of claim 5. The billing codes of *Harvin/Virginia et al.* and *PR Newswire* are specific codes for a current diagnosis, not all codes supported by patient information. *Harvin/Virginia et al.* merely link to billing information (page 4, paragraph



3). There is no disclosure of extracting all codes supported by the patient record and no disclosure of extracting as a function of all domain-specific criteria.

Likewise, *PR Newswire* provides automatic coding (page 2, paragraphs 2 and 3), but does so based only on the final physician diagnosis (page 2, paragraph 5). *PR Newswire* does not disclose extracting all codes supported by the patient information.

The combination of *Evans, Harvin/Virginia et al.* and *PR Newswire* does not teach or suggest extracting all billing codes that are supported by the patient information based on all domain-specific criteria in a domain knowledge base, as required by dependent claims 5 and 42. Accordingly, reversal of this ground of rejection is respectfully requested.

*(c) Rejection of Claims 6 and 7*

Claims 6 and 7 recite institution-specific domain knowledge. The Examiner relies on *Harvin/Virginia et al.* (Office Action dated Sept. 21, 2005, page 6) or *PR Newswire* (Office Action dated January 26, 2007) for this limitation. Although *Harvin/Virginia et al.* discloses the existence of an institution (page 2, paragraph 1), the reference notes the existence of an institution in the context of having financial liability. There is no disclosure of "institution-specific domain knowledge" used for analysis by a device. Similarly, the required reporting (page 2, paragraph 7) does not provide for hospital based domain knowledge used for analysis by a computer.

*PR Newswire* has a knowledgebase tailored to a physicians specialty (page 2, paragraph 2). There is no disclosure of institution specific domain knowledge.

The combination of *Evans, Harvin/Virginia et al.* and *PR Newswire* does not teach or suggest "institution-specific domain knowledge," as required by dependent claims 6 and 7. Accordingly, reversal of this ground of rejection is respectfully requested.

*(d) Rejection of Claims 8 and 9*

Claims 8 and 9 recite condition-specific or disease-specific domain knowledge used for analysis of patient data by a device. The Examiner relies on *Evans* at col. 7, lines 1-9 and col. 14, lines 45-67 for the limitations (Office Action dated Sept. 21, 2005,

page 7 and Office Action dated January 26, 2007, page 5). *Evans* relates to mere data entry by a physician for analysis by the physician (*Evans* Col. 7, lines 1-9; and col. 14, lines 45-67)—not knowledge used for searching the patient record by a computer. Creating an audit trail of data entry (Col. 14, lines 45-67) is not condition or disease specific knowledge for analyzing the patient record by a computer.

The combination of *Evans*, *Harvin/Virginia et al.* and *PR Newswire* does not teach or suggest condition-specific or disease-specific domain knowledge, as required by dependent claims 8 and 9. Accordingly, reversal of this ground of rejection is respectfully requested.

*(e) Rejection of Claims 10, 11, 24, 28 and 29*

Claims 10, 11, 24, 28 and 29 recite an explanation with a pointer to information supporting the extracted billing information. *Evans* discloses pointers to other data sources making up the patient record (col. 8, lines 34-65)—not pointers to information supporting extracted data, as required by the claimed invention. *Harvin/Virginia et al.* disclose linking to billing information (page 4, paragraphs 3 and 4)—not pointing to supporting information providing the basis for the billing codes.

*PR Newswire* discloses that “the HCFA complaint billing codes created by iMedica Physician suite keep me worry-free” is cited (page 1, paragraph 5). Creating order to keep a person worry-free is not an explanation and is not a pointer to information supporting the extracted billing information.

The combination of *Evans*, *Harvin/Virginia et al.* and *PR Newswire* does not teach or suggest an explanation with a pointer to information supporting the extracted billing information, as required by dependent claims 10, 11, 24, 28 and 29. Accordingly, reversal of this ground of rejection is respectfully requested.

*(f) Rejection of Claims 12, 13, 14, 30 and 31*

Claims 12, 13, 14, 30 and 31 recite automatically generating a medical claim for the patient using the extracted billing information. As noted above, *Harvin/Virginia et al.* link to billing information and automate some other aspects (page 4, paragraphs 3 and 7). However, *Harvin/Virginia et al.* do not disclose automatically generating a medical

claim for the patient using the extracted billing information. Nor does *Harvin/Virginia et al.* disclose extracting the billing information.

At page 2, paragraph 7, *Harvin/Virginia et al.* provides that "the state of government of Florida is nationally thought to be a forerunner in managed care legislation. Florida has mandated Medipass, a system whereby all state Medicaid recipients (With exceptions) must choose an HMO or registered Medipass provider to receive their primary health care. Qualifying Medipass HMOs or providers are required to comply with outcomes tracking and case/patient management guidelines that are inherent in the program. Other states are increasingly implementing similar systems. An integrated clinical and financial management system is critical for monitoring utilization patterns and for tracking payments in this current state of health delivery." Financial management for tracking payments and monitoring utilization is not generating a medical claim.

*PR Newswire* discloses secure and redundant storage of the medical record (page 2, paragraph 12) and providing billing codes for accurate billing (page 3, paragraph 1), but does not teach or suggest generating a medical claim.

The combination of *Evans*, *Harvin/Virginia et al.* and *PR Newswire* does not teach or suggest automatically generating a medical claim for the patient using the extracted billing information, as required by dependent claims 12, 13, 14, 30 and 31. Accordingly, reversal of this ground of rejection is respectfully requested.

*(g) Rejection of Claims 18, 19, 20, 35 and 36*

Claims 18, 19, 20, 35 and 36 recite automatic assessment of the quality of information of the medical record using the extracted billing information. The Examiner relies on *Harvin/Virginia et al.* (Office Action dated Sept. 21, 2005, pages 9 and 13-14 and Office Action dated January 26, 2007, pages 8, 9 and 14). *Harvin/Virginia et al.* assume the medical record data is accurate (page 5, paragraphs 4 and 6). Improving quality outcomes (page 5, Paragraph 6) is not assessing quality using extracted billing information. Measuring outcome (page 4, paragraph 7) is not assessing quality using extracted billing information. Gathering input for purchase decisions of software at paragraphs 8-11 is not assessing quality using extracted billing information.

The combination of *Evans, Harvin/Virginia et al.* and *PR Newswire* does not teach or suggest automatic assessment of the quality of information of the medical record using the extracted billing information, as required by dependent claims 18, 19, 20, 35 and 36. Accordingly, reversal of this ground of rejection is respectfully requested.

*(h) Rejection of Claims 21, 22, 23 and 37*

Claims 21, 22, 23 and 37 recite automatically determining an expected amount of reimbursement. *Harvin/Virginia et al.* note case tracking (page 2, paragraph 7) and the importance of identifying profitability (page 4, paragraph 1). However, *Harvin/Virginia et al.* relies on data entry to assist these goals—not on any determination of an expected amount of reimbursement.

*PR Newswire* notes that “a major benefit of PhysicianSuite is the Superbill. The solution automatically recommends billing codes based on the charting results, and is compliant with reimbursement regulations published by the Health Care Financing Administration (HCFA), which regulates Medicare. This feature assures correct and accurate billing is accomplished quickly while providing an audit trail of supporting coding documentation with minimal effort” (Page 3, paragraph 1). Billing codes compliant with reimbursement regulations for billing with an audit trail do not indicate an amount. Codes are not an amount of reimbursement.

The combination of *Evans, Harvin/Virginia et al.* and *PR Newswire* does not teach or suggest automatically determining an expected amount of reimbursement, as required by dependent claims 21, 22, 23 and 37. Accordingly, reversal of this ground of rejection is respectfully requested.

*(i) Rejection of Claims 43, 46, and 49*

Claims 43, 46, and 49 recite inferring a diagnosis and associated billing information. The Examiner previously relied on *Evans* (Advisory Action, page 2, ¶ H). In particular, *Evans* is quoted—Fig. 18 shows “a block diagram [that] illustrates the structure of the optional reference database 104 (Fig. 1). The reference database includes a diagnosis module 300” (co. 11, lines 15-24). *Evans* discloses a reference database that includes a diagnosis module that a physician can use prospectively for

assistance in diagnosing a patient (Col. 11, lines 15-24). The diagnosis module 300 communicates with medication and procedure modules (col. 11, lines 19-30) and provides a list of diagnosis codes (col. 11, lines 36-57) for selection. However, *Evans* does not disclose inferring a diagnosis and associated billing information from the medical record.

In the last Office Action (dated January 26, 2007), the Examiner cited to *PR Newswire* and *Harvin/Virginia et al.* *PR Newswire* is not a diagnostic tool (page 2, paragraph 5). Intuitive charting assists in entering a patient record (page 2, paragraph 5), but intuitive charting is not inferring a diagnosis. Recommending billing codes based on the chart (page 3, paragraph 1) is also not inferring a diagnosis.

*Harvin/Virginia et al.* disclose linking complaints with diagnosis and clinical and billing information (page 4, paragraph 3). Linking is not inferring.

The combination of *Evans*, *Harvin/Virginia et al.* and *PR Newswire* does not teach or suggest inferring a diagnosis and associated billing information, as required by dependent claims 43, 46 and 49. Accordingly, reversal of this ground of rejection is respectfully requested.

*(j) Rejection of Claims 44, 47 and 50*

Claims 44, 47 and 50 recite inferring without reference to diagnosis codes. The Examiner relies on *PR Newswire* (Office Action dated March 13, 2006, pages 6-7, paragraph F and Office Action dated January 26, 2007, pages 17-19). *PR Newswire* provides billing code recommendations based on the chart after guiding the chart creation (page 2, paragraph 2). There is no disclosure that the billing codes are not based on diagnosis codes. Although *PR Newswire* discloses creating a patient record and storing the patient record on the Internet with a wireless computer and knowledgebase tailored to a specialty for common workflow (page 2, paragraphs 2, 3), there is no disclosure of inferring a diagnosis without reference to diagnosis codes. *PR Newswire* starts after the doctor reaches a diagnosis, and uses the diagnosis to identify the common workflow (page 2, paragraph 5). There is no disclosure of inferring without reference to diagnosis codes, as required by the claimed invention.

The combination of *Evans, Harvin/Virginia et al.* and PR Newswire does not teach or suggest inferring without reference to diagnosis codes, as required by dependent claims 44, 47 and 50. Accordingly, reversal of this ground of rejection is respectfully requested.

*(k) Rejection of Claims 45, 48 and 51*

Claims 45, 48 and 51 recite determining a probability as part of inferring a diagnosis. The Examiner relies on *Harvin/Virginia et al.* (Advisory Action, page 2, paragraph I and Office Action dated January 26, 2007, pages 18-19). In particular, *Harvin/Virginia et al.* provide that "the findings of the caregiver, and registration demographics, are all logged into the electronic medical record. Information can then be extracted for performance improvement and outcomes measuring: how many children under age 3 have been fully immunized, how many males with adult onset diabetes received a visit in the last 6 months, of those how many had commercial insurance; how many females with Class 3 pap smears received referral visits within 45 days of diagnosis, etcetera. The possibilities are endless and simultaneously so vital that you'll wonder, 'Why did we wait so long to do this?'" (page 4, paragraph 7). *Harvin/Virginia et al.* note various statistics calculated from the structured database and indicate that the possibilities for such reports are endless (page 4, paragraph 7). There is no suggestion of determining a probability as part of inferring a diagnosis with a computer.

The combination of *Evans, Harvin/Virginia et al.* and PR Newswire does not teach or suggest determining a probability as part of inferring a diagnosis, as required by dependent claims 45, 48 and 51. Accordingly, reversal of this ground of rejection is respectfully requested.

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**Conclusion**

In conclusion, Appellants respectfully submit that the rejection raised by the Examiner has been overcome for at least the reasons set forth above. Accordingly, reversal of all grounds of rejection is respectfully requested.

Respectfully submitted,

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**Claims Appendix**

1. A method for processing medical information, comprising the steps of:  
obtaining a medical record of a patient, wherein the medical record comprises patient information from structured and unstructured data sources;  
analyzing with a computer the patient information from at least the unstructured data source in the medical record using domain-specific criteria; and  
automatically extracting billing information from the medical record as part of the analysis.
2. The method of claim 1, wherein extracting billing information comprises extracting one or more billing codes.
3. The method of claim 2, wherein the billing codes comprise a diagnosis code, a procedure code or both.
4. The method of claim 1, wherein the patient information comprises clinical information and financial information of the patient.
5. The method of claim 1, wherein extracting billing information comprises extracting all billing codes that are supported by the patient information based on all domain-specific criteria in a domain knowledge base.
6. The method of claim 1, wherein the domain-specific criteria comprises institution-specific domain knowledge.
7. The method of claim 6, wherein the institution-specific domain knowledge relates to one or more of data at a hospital, document structures at a hospital, policies of a hospital, guidelines of a hospital, and variations at a hospital.



8. The method of claim 1, wherein the domain-specific criteria includes condition-specific or disease-specific domain knowledge.
9. The method of claim 8, wherein the condition-specific or disease-specific domain knowledge includes one or more of factors that influence risk of a condition or disease, disease progression information, complications information, outcomes and variables related to a condition or disease, measurements related to a condition or disease, and policies and guidelines established by medical bodies.
10. The method of claim 1, further comprising generating an explanation that includes one or more pointers to relevant patient information, relevant domain-specific criteria, or relevant patient information and domain-specific criteria, which supports the extracted billing information.
11. The method of claim 10, further comprising presenting the explanation to a user for verifying the billing information.
12. The method of claim 1, further comprising automatically generating a medical claim for the patient using the extracted billing information.
13. The method of claim 1, further comprising:  
presenting the extracted billing information to the user for verification; and  
automatically generating a medical claim for the patient using the extracted billing information, if the extracted billing information is verified by the user.
14. The method of claim 13, further comprising:  
modifying the extracted billing information in response to user input, if the billing information is not verified by the user; and  
automatically generating a medical claim for the patient using the modified extracted billing information.

15. The method of claim 1, further comprising automatically updating the medical record of the patient using the extracted billing information.

16. The method of claim 15, wherein automatically updating the medical record comprises using the extracted billing information to (i) correct billing information in the medical record, which is determined to be incorrectly recorded in the medical record or (ii) insert billing information into the medical record, which is determined to be missing from the medical record.

17. The method of claim 15, further comprising presenting an updated medical record to a user for verification, wherein automatically updating the medical record of the patient is performed in the updated medical record is verified by the user.

18. The method of claim 1, further comprising:

(a) automatically assessing the quality of the patient information of the medical record using the extracted billing information to obtain quality assessment results; and

(b) storing the quality assessment results for the medical record.

19. The method of claim 18, further comprising performing steps (a) and (b) for a plurality of medical records in an electronic database; and

automatically generating quality assurance statistics based on the quality assessment results obtained for the plurality of medical records.

20. The method of claim 18, wherein the quality assessment results comprise information regarding occurrences of correct, incorrect and/or missing billing codes in the medical record.

21. The method of claim 1, further comprising automatically determining an expected amount of medical billing reimbursement based on the extracted billing information.

22. The method of claim 21, further comprising:  
maintaining the expected amount in the medical record; and  
reconciling the expected amount with an actual reimbursement received.
23. The method of claim 21, wherein determining an expected amount of medical billing reimbursement further depends on whether or not clinical guidelines have been followed as specified by domain-specific criteria.
24. The method of claim 10, wherein the explanation further comprises information as to whether or not clinical guidelines have been followed as specified by domain-specific criteria.
25. A system for processing medical information, comprising:  
an electronic database comprising a knowledge base of domain-specific criteria;  
and  
an engine of a device that automatically extracts billing information from a medical record the medical record comprising patient information from structured and unstructured data sources, by analyzing the patient information from at least the unstructured data source using the domain-specific criteria.
26. The system of claim 25, wherein the engine extracts billing information comprising billing codes.
27. The system of claim 26, wherein the billing codes comprise diagnosis codes, procedure codes, or both.
28. The system of claim 25, wherein the engine generates an explanation that includes one or more pointers to relevant patient information, relevant domain-specific criteria, or relevant patient information and domain-specific criteria, which supports the extracted billing information.

29. The system of claim 28, further comprising a user interface for presenting the explanation to a user to enable the user to verify the extracted billing information.

30. The system of claim 26, further comprising an automated billing system that automatically generates a medical claim for the patient using the extracted billing information output from the engine.

31. The system of claim 30, further comprising a user interface that presents the extracted billing information to a user and enables a user to verify the extracted billing information and modify the extracted billing information before automatically generating a medical claim based on the verified or modified billing information.

32. The system of claim 25, wherein the engine can automatically update the medical record of the patient using the extracted billing information.

33. The system of claim 32, wherein the engine can automatically update the medical record by using the extracted billing information to (i) correct billing information in the medical record, which is determined to be incorrectly recorded in the medical record or (ii) insert billing information into the medical record, which is determined to be missing from the medical record.

34. The system of claim 31, further comprising a user interface that presents an updated medical record to a user and enables the user to verify the updated medical record before automatically updating the medical record of the patient.

35. The system of claim 25, wherein the engine can automatically assess the quality of patient information for each of a plurality of medical records using extracted billing information from each of the medical records and automatically generate quality assurance statistics based on the quality assessment results obtained for the plurality of medical records.

36. The system of claim 35, wherein the quality assessment results comprise information regarding occurrences of correct, incorrect and/or missing billing codes in the medical record.

37. The system of claim 25, wherein the engine can automatically determine an expected amount of medical billing reimbursement based on the extracted billing information from the medical record and reconciles the expected amount with an actual reimbursement received.

38. The system of claim 25, wherein the system operates as a service by a service provider for processing patient medical records in a database of a subscribing entity.

39. In a program storage device readable by a machine, tangibly embodying a program of instructions executable on the machine to perform steps for processing medical information, the program storage device comprising instructions for:

obtaining a medical record of a patient, wherein the medical record comprises patient information from structured and unstructured data sources;

analyzing the patient information from at least the unstructured data source in the medical record using domain-specific criteria; and

automatically extracting billing information from the medical record as part of the analysis.

40. The program storage device of claim 39, wherein the instructions for extracting billing information comprise instructions for extracting one or more billing codes.

41. The program storage device of claim 39, wherein the patient information comprises clinical information and financial information of the patient.

42. The program storage device of claim 39, wherein the instructions for extracting billing information comprise instructions for extracting all billing codes that are supported

by the patient information based on all domain-specific criteria in a domain knowledge base.

43. The method of Claim 1 wherein automatically extracting comprises inferring a diagnosis and the associated billing information from the medical record.

44. The method of Claim 43 wherein inferring comprises inferring the diagnosis and the associated billing information from the medical record without reference to diagnosis codes.

45. The method of Claim 43 wherein inferring comprises determining a probability.

46. The system of Claim 25 wherein the engine is operable to infer a diagnosis and the associated billing information from the medical record.

47. The system of Claim 46 wherein the engine is operable to infer the diagnosis and the associated billing information from the medical record without reference to diagnosis codes.

48. The system of Claim 46 wherein the engine is operable to determine a probability associated with the inferred diagnosis.

49. The program storage device of Claim 38 wherein automatically extracting comprises inferring a diagnosis and the associated billing information from the medical record.

50. The program storage device of Claim 49 wherein inferring comprises inferring the diagnosis and the associated billing information from the medical record without reference to diagnosis codes.

51. The program storage device of Claim 49 wherein inferring comprises determining a probability.

**Evidence Appendix**

None



**Related Proceedings Appendix**

None

**Prior Art Appendix**

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## iMedica Creates the Most Comprehensive Charting Solution Harnessing the Power Of the Internet Wirelessly

PR Newswire, New York, Jan 18, 2000, pg. 1

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 Source Type: Wire feed  
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 Text Word Count: 876  
 Article URL: [http://gateway.proquest.com/openurl?url\\_ver=Z39.88-2004&req\\_dat=xri:pqd&rft\\_val\\_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&rft\\_dat=xri:pqd:dld=000](http://gateway.proquest.com/openurl?url_ver=Z39.88-2004&req_dat=xri:pqd&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&rft_dat=xri:pqd:dld=000)

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4 MOUNTAIN VIEW, Calif., Jan. 18 /PRNewswire/ — iMedica Corp., the Physician's e-Advocate, today released iMedica PhysicianSuite(TM), a comprehensive, rapid charting solution that enables physicians to accurately chart in a fraction of time and access patient records on a secure Internet connection anytime, anywhere. The iMedica solution also allows the physician to send the prescription to any of 30,000 pharmacies via the Internet after automatically checking formulary and drug interactions. Automatic interaction and allergy alerts ensure safety for the patient. The database contains the latest information on drugs and any precautionary information — an important tool for physicians striving to keep current with the daily release of new medicines.

5 "PhysicianSuite allows me to spend more time focusing on medicine and less time with administrative tasks," said Albert Shen, M.D., active attending physician at Stanford Medical Center, and one of the physicians who beta-tested the product. "Record-keeping is of extreme importance to quality, and iMedica's solution has made that part of my practice much less time consuming. The HCFA compliant billing codes created by iMedica PhysicianSuite keep me worry free."

6 iMedica, headquartered in Mountain View, California, is the physician's e-advocate. iMedica brings leading Internet and intelligent system technologies to the point-of-care environment. iMedica PhysicianSuite solution enhances the physician-patient relationship while streamlining the office workflow, resulting in recovered time, reduced expenses and improved patient care. Privately held, the company has raised substantial funding from BioAsia Investments, Nina Wong and Leavitt Fund.

Full Text (876 words)

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Features Rapid Encounter Note Creation, Online Prescriptions, Formulary, Drug Interactions, Optimized Office Workflow, and 24/7 Secure Internet Access

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## Of Patient Medical Records

1 MOUNTAIN VIEW, Calif., Jan. 18 /PRNewswire/ -- iMedica Corp., the Physician's e-Advocate, today released iMedica PhysicianSuite(TM), a comprehensive, rapid charting solution that enables physicians to accurately chart in a fraction of time and access patient records on a secure Internet connection anytime, anywhere. The iMedica solution also allows the physician to send the prescription to any of 30,000 pharmacies via the Internet after automatically checking formulary and drug interactions. Automatic interaction and allergy alerts ensure safety for the patient. The database contains the latest information on drugs and any precautionary information -- an important tool for physicians striving to keep current with the daily release of new medicines.

2 PhysicianSuite goes to the next step of clinical medical practice by creating a legible electronic record for each patient visit, which is then stored on the Internet. The wireless, pen-based computer system contains a knowledgebase tailored to a physician's specialty and addresses common workflow bottlenecks by providing superior documentation, automatic HCFA/Medicare compliant coding and secure records storage.

3 "PhysicianSuite allows me to spend more time focusing on medicine and less time with administrative tasks," said Albert Shen, M.D., active attending physician at Stanford Medical Center, and one of the physicians who beta-tested the product. "Record-keeping is of extreme importance to quality, and iMedica's solution has made that part of my practice much less time consuming. The HCFA compliant billing codes created by iMedica PhysicianSuite keep me worry free."

4 Knowledgebase the Key to Intelligent Rapid Charting

5 PhysicianSuite enables comprehensive documentation of the patient encounter in less time. When the physician has arrived at a diagnosis the specialty knowledgebase guides the physician through an intuitive sequence of medical choices and ICD-9CM diagnoses codes. Choosing from preinstalled Common Disease Templates (CDT), PhysicianSuite designates the symptoms most commonly associated with each diagnosis, making chart development considerably faster than using conventional methods. While not a diagnostic tool, the knowledgebase contains information that makes rapid and accurate charting possible.

6 "Although physicians have a level of comfort with the traditional paperbound charting approach, it is inefficient," said Dr. Charles Koo, CEO and president of iMedica. "Manually documenting the patient visit takes up a lot of the physicians' and office staff's time. And because the information is trapped on paper its usefulness pales beside the electronic and real-time benefits of the increasingly Internet-dominated world in which we live."

7 Physician-Driven Design

8 More than fifteen physicians are actively participating in design and developing medical content. Additional physicians consulted with iMedica during product inception, development and beta testing.

9 This physician driven design provides a solution that both enhances patient care and eliminates unproductive administrative tasks. Aimed at 350,000 independent physicians in the U.S., PhysicianSuite is specialty-focused with initial versions developed for the medical practices of cardiologists and internists.

10 Internet Access to Medical Information 24x7

11 Medical encounters are charted on a real-time basis right in the examination room, creating a secure Internet record of the visit. Authorized persons, including consulting physicians and doctors within the same practice who are on call evenings and weekends, have instant access to the chart from any computer connected to the Internet, using a standard browser.

12 "There are few things as personal as one's medical record," said Kathleen A. O'Connor, MBA, healthcare consultant in medical record security. The Health Insurance Portability and Accountability Act (HIPAA) of 1996 mandates security guidelines for electronic applications involving patient personal and medical information. "By adopting a multi-layer encryption and a proprietary security control measure, iMedica assures data privacy," O'Connor said. Files are backed up in the same secure site used by Blue Shield, Kaiser and VISA International to store their sensitive data. Finally, to prevent any data loss, each patient record is stored with multiple redundancy.

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# Automatic HCFA/Medicare Code Creation

A major benefit of PhysicianSuite is the Superbill. The solution automatically recommends billing codes based on the charting results, and is compliant with reimbursement regulations published by the Health Care Financing Administration (HCFA), which regulates Medicare. This feature assures correct and accurate billing is accomplished quickly while providing an audit trail of supporting coding documentation with minimal effort.

## Availability and Pricing

PhysicianSuite is a total solution available for a monthly fee. The programs offered are specifically designed for Cardiologists and Internists. PhysicianSuite, with its modular design, can be configured specifically for each physician's office workflow and needs. The minimum configuration of PhysicianSuite (includes modules for the physician and the office manager on a pen-based mobile computer) is being offered for a special six-month introductory price of \$199 per month.

## About iMedica Corporation

iMedica, headquartered in Mountain View, California, is the physician's e-advocate. iMedica brings leading Internet and intelligent system technologies to the point-of-care environment. iMedica PhysicianSuite solution enhances the physician-patient relationship while streamlining the office workflow, resulting in recovered time, reduced expenses and improved patient care. Privately held, the company has raised substantial funding from BioAsia Investments, Nina Wong and Leavitt Fund.

For more information on iMedica visit [www.imedica.com](http://www.imedica.com). Telephone: 877-MDSuite (877-637-8483).

NOTE: iMedica PhysicianSuite is a trademark of iMedica Corporation. All other company names and products are trademarks or registered trademarks of their respective companies. SOURCE iMedica Corp.

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## Managed Care: New Financial/Practice Strategies to Manage More Efficiently/Effectively in a Primary Care Setting

Virginia Smith Harvin, Michael O Martin, Gustavo Gallego. Nursing Administration Quarterly. Frederick: Spring 1998. Vol. 22, Iss. 3; pg. 53, 6 pgs

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Subjects: [Primary care](#), [Managed care](#), [Medical records](#), [Software](#)  
 Locations: [Dade County Florida](#)  
 Companies: [North Dade Health Center-Florida](#)  
 Author(s): [Virginia Smith Harvin](#), [Michael O Martin](#), [Gustavo Gallego](#)  
 Article type: [Feature](#)  
 Publication title: [Nursing Administration Quarterly. Frederick: Spring 1998. Vol. 22, Iss. 3; pg. 53, 6 pgs](#)  
 Source Type: [Periodical](#)  
 ISSN/ISBN: [03639588](#)  
 ProQuest document ID: [29589494](#)  
 Text Word Count: [2200](#)  
 Article URL: [http://gateway.proquest.com/openurl?url\\_ver=Z39.88-2004&res\\_dat=xri:pqd&rft\\_val\\_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&rft\\_dat=xri:pqd:dld=000](http://gateway.proquest.com/openurl?url_ver=Z39.88-2004&res_dat=xri:pqd&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&rft_dat=xri:pqd:dld=000)

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3 ~ Abstract (Article Summary)

4 ~ In Florida, the North Dade Health Center (NDHC) is one of the primary care facilities of the the Public Health Trust of Dade County FL. NDHC aims to improve managed care, case management, appointment scheduling and electronic medical records.

5 ~ Full Text (2200 words)

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7 ~ Managed Care: New Financial/Practice Strategies to Manage More Efficiently/Effectively in a Primary Care Setting

8 ~ Twenty years ago managed care in the United States was barely noticeable. Ten years ago the concept was firmly in place and growing. Twenty months ago it was pervasive. And a mere 10 days ago it probably comprised 20 percent of the patient population at your facility. What brought about such rapid growth? Simply put-uncontrollable costs.

9 ~ The impact of the recent Florida legislation has dramatically redefined the way providers are compensated for their services. Hospitals, medical groups, and primary care facilities are fighting a constant battle to get reimbursed under managed care programs. Procedural and practice errors not only consume valuable staff time, but also translate into delays in payment and often loss of revenue.

10 ~ Technological advances and government intervention mean that today's health care delivery systems are

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1. /constantly changing. Primary care facilities share in the financial liabilities because, in addition to delivering patient care, capitation reimbursement methods involve significant financial risks. Cost containment pressures and complicated treatment protocols can also create impediments to the delivery of high quality care. The ideal scenario is to continue to provide quality care, increase revenue, reduce cost, and minimize the risk.

2. The Public Health Trust (PHT) of Dade County, Florida, has a unique model that encompasses a 1,000-plus-bed teaching hospital (JMH), the University of Miami School of Medicine as the academic arm, a level one trauma center, an ambulatory clinic on-site, and seven primary care facilities (one with two school-based health centers), decentralized throughout the county with nearly 350,000 outpatient visits.

3. Each facility mentioned has unique technology requirements and each needs to "talk" to the others. This potentially problematic requirement is shared by many health systems with satellites. What follows is an explanation of our approach to managing this challenge.

#### 4. The vision

5. In 1990, the management staff at North Dade Health Center (NDHC), one of the primary care facilities of the PHT, located 13 miles north of the main site, developed a vision to be the best primary care center in Dade County. Part of that vision included the goal of a network of primary care centers sharing a computerized financial and clinical information system by the year 2000. The idea at the time seemed grandiose and futuristic. But, as everyone even remotely connected to health care has learned, the future is now.

#### 6. Legislative focus

7. The state government of Florida is nationally thought to be a forerunner in managed care legislation. Florida has mandated Medipass, a system whereby all state Medicaid recipients (with few exceptions) must choose an HMO or registered Medipass provider to receive their primary health care. Qualifying Medipass HMOs or providers are required to comply with outcomes tracking and case/patient management guidelines that are inherent in the program. Other states are increasingly implementing similar systems. An integrated clinical and financial management system is critical for monitoring utilization patterns and for tracking payments in this current state of health delivery.

#### 8. Financial management

9. Managed care has placed NDHC in an environment where our Medicaid patients are aggressively pursued by our competitors, which are for-profit corporations. These corporations' marketing efforts are geared to have a direct impact on the bottom line.

10. We shared with management the system requirements that would enable NDHC and the other primary care centers to survive in today's competitive market. Our initial presentation was in July of 1995 and phase one of the implementation started in late April, 1997. The first system scheduled for implementation is the financial system.

11. Listed below we have an outline of the analysis that identified the necessary applications required to help a primary care center successfully survive in today's environment.

#### 12. Technology development

13. Technical billing, which will include but not be limited to facility fee, ancillary, pharmacy, and other services that are billed on the universal billing form known as the "UB92"

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Required	Phase I
Technical Billing (UB92)	5/02/07
Professional Billing (1500)	5/02/07
Accounts Receivable	5/02/07
Management Reporting	Anticipated 10/07
Contract Management	Anticipated 10/07
Multi-Entity Billing	Anticipated 10/07

## Phase I

- 1 Professional billing, which will bill for physician services using a "1500" billing form layout. When the original transaction is entered into the system the UB92 and the 1500 forms should be simultaneously generated.
- 2 Accounts receivable function will track our receivables and provide for appropriate write-offs and contractual adjustments.
- 3 Management reporting functions will enhance the quality of data extracted from the system. Specialty standard reports exist for the primary care center. The system should specialize in primary care needs.
- 4 Contract management is a necessity in our dynamic environment. All managed care products should be loaded into our system. It is necessary to have tools in place to monitor and evaluate current and future managed care products.
- 5 Multi-entity billing capability is a necessity. It must not only be cost-efficient to bring on a new provider group, but it must be user-friendly and easily expanded within a reasonable time frame.
- 6 Multiple fee schedules enable the provider to maximize billing capabilities. One summary charge should have the ability to bill as 5 individual charges.
- 7 Practice management
  - 8 People are more sophisticated now than 20 years ago. Industrialization, communication, and advanced technologies have changed the way we live and behave. We are pressured for time and time has become an expensive commodity and a valuable asset in our daily life. Historically, health care providers ignore this value, especially if the owner of this precious asset is a patient. How many times have you experienced the agony of waiting for your turn to see the physician-sitting, anxiously waiting for your name to be called? And after your vital signs are taken the waiting continues for the actual physician/patient encounter. Add to this scenario the inefficiency of some of today's health care systems and you will have the sum total of time wasted. Countless hours of idle time are squandered as patients seek health care.
  - 9 The recent emphasis given to ambulatory care has generated increased attention to the care delivery systems of this sector of the health care industry. External pressures, rooted mainly in the bottom line, have forced ambulatory care administrators to react and decide quickly. The outcome has been a menagerie of piecemeal solutions resulting in patient confusion, dissatisfaction, and anxiety about entering into the ambulatory care setting. Efficient patient access to the care system is a central goal of outpatient clinical and management processes.
  - 10 Now, can you imagine seeing more of your patients using a super efficient system? Onestop shopping in a patient-friendly environment? An efficient administrative system enabling the physicians and other medical providers to concentrate on patient care and spend additional time with the patient?
  - 11 That is why at NDHC we are proposing system changes to provide a better service to our customers. Our vision is to enhance the present practice management system to cover managed care, case management, appointment scheduling, and electronic medical records.
  - 12 Managed care
  - 13 We support people to more effectively and efficiently manage our managed care contracts and services. Tighter

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controls and more intricate requirements of managed care have dramatically increased the workload of the office and the clinical staff. They need a state-of-the-art system to deal with the complex tasks of addressing unique requirements of payer contracts. Management has to be able to identify contract performance and profitability. This system must be integrated with the appointment system. The user should be able to instantaneously look up member files during the appointment scheduling. This type of relation ensures that appointments have the required authorization. In addition, the system must be able to manage various health plans and their terms and conditions so that the visit can be properly priced.

## Electronic medical records

Electronic patient records are the key to fully integrated health care systems. According to Mark L. Braunstein, MD, cofounder and chief executive officer of Atlanta-based ePatient Care Technologies, Inc., "The record itself can help clinicians improve the process of care." Electronic medical records can simplify routine patient visits by providing customized lists of common complaints linked with relevant diagnoses. It can enhance care delivery with automatic alerts, patient reminders, drug interaction checking, and patient education. It can integrate with existing office systems to link clinical and billing information at the point of service. It reduces the administrative burden via real-time access to formularies and referral lists; codes notes, procedures, and diagnosis automatically; ensures efficient office workflow with automatic notice to patients waiting; supports business and clinical decisions based on reports generated from structured Oracle database. Can this better information improve the care process?

Electronic medical records will replace the existing paper charts that lack structure and consistency and often are illegible. This will require substantial reengineering of the work process. Resistance can be anticipated from users who are not familiar with computer technology. However, this must be overcome. By structuring the data we capture at the point of care, we will have more information to help improve patient care, make better business decisions, and stay competitive.

## Patient care outcomes

Technology has entered the patient's room. Or in the case of outpatient care, the exam room. As Mark Hagland says in Health Management Technology, the question is not whether the Internet will be a part of patient care but how.

The findings of the caregiver, and registration demographics, are all logged into the electronic medical record. Information can then be extracted for performance improvement and outcomes measuring: how many children under age 3 have been fully immunized, how many males with adult onset diabetes received a visit in the last 6 months, of those how many had commercial insurance; how many females with Class 3 pap smears received referral visits within 45 days of diagnosis, etcetera. The possibilities are endless and simultaneously so vital that you'll wonder, "Why did we wait so long to do this?"

Because of all of the technology available it can seem like a "cat in the aviary" experience-you want to try it all. However, a word of caution. Health care providers are held accountable for the results they achieve and report. Your purpose dictates what data you want measured. Is your organization private or public, profit or nonprofit? Do you answer to a board of directors or a chief executive officer (CEO)? Are you accredited by the Joint Commission or other accrediting agency? Do you need to factor in data to address specific issues of the city, state, or county in which you practice? You get the idea, research before you buy. What's important to your methodology may not even be considered in some information systems that are available on the market.

In addition, gather input from all those involved directly and indirectly, from the medical director to the health educator to the registrar to the finance director to the information specialist to the community board member. What outcomes are important to your practice and how can the information be entered with the least duplication of effort?

## Conclusion

Better management of populations, patients, payers, and care using information technology is the CEO's and chief financial officer's thrust, and the middle manager's daily working tool. If you have not seriously considered an information system to meet your current and envisioned needs, do so immediately. Find the software that is most compatible with your needs. And don't forget the reputation of the company. Ask the representative for a list of satisfied (and dissatisfied) customers. Talk to them. Remember it is not always necessary to invest in the latest equipment. Seek out what's been proven successful and reliable for others.

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1 This article shares our experience on where to begin and hopefully serves as a practical guide to achieving a computerized information system that can:

2 1. Redeploy FTEs in manual finance tasks to case management, customer contact, and system analyst positions.

3 2. Increase revenues by providing comprehensive financial analysis of patients, maximizing payer potential.

4 3. Improve satisfaction by giving physicians rapid access to valuable clinical information and analysis of data. By improving this access, patients are able to receive concise and accurate information when they call, and staff can quickly access multiple data with minimal keystrokes.

5 4. Define your facility as integrated and comprehensive in delivery of care, whether in one location or multiple sites.

6 5. Contribute to your survival in the business of managed care. Improve quality outcomes. Structure data to be captured at the point of service. By doing this primary care facilities will have more information to help improve patient care, make better business decisions, and stay competitive.

7 6. Free physicians from the masses of paper by using electronic medical record systems and allowing them to see more patients as well as delivering the best care possible.

8 7. In the February 3, 1997, Issue of Modern Health Care, Karen Pallarito in her article, "The Clock Is Ticking," suggests that health care providers who want to be of value to the customers they serve must comfortably embrace the use of emerging information technology. Information, and the expedient use of the right information, are the key to managing health care outcomes and service delivery. 3. Crafting information systems that encompass financial and technological management are the critical business tools contributing to bottom line success and quality comprehensive health care.

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